

Application No. 10/605,241
Docket No. 121441-7
Amendment dated June 18, 2004
Reply to Office Action of March 18, 2004

REMARKS

In the Office Action, the Examiner reviewed claims 1-12 of the above-identified US Patent Application, with the result that claims 5, 9 and 10 were objected to, claims 1-12 were rejected under 35 USC §112, second paragraph, and claims 1-12 were rejected under 35 USC §102 in view of three prior art references. In response, Applicants have amended the specification and claims as set forth above. Particularly:

The title of the invention has been amended to be more descriptive of the invention recited in the pending claims.

Independent claims 1 and 8 have been amended to recite that the through-hole/cooling holes (12) are machined. Support for these amendments can be found in Applicants' specification at paragraph [0016] and Figures 3-7.

Independent claims 1 and 8 have been further amended to recite that each hole (12) has a first through-hole surface defined by the component (10) and a second through-hole surface defined by a portion of the coating/layer (20) exposed by removal of a deposit (22), as shown and described in reference to Figures 1 and 2.

Independent claims 1 and 8 have also been amended to recite that the holes (12) are free of debris from the deposit (22), the first through-hole surface is impact-flattened and has a better than as-machined surface finish, and the through-hole is characterized by a better than as-machined discharge coefficient, and claim 8 has been further amended to recite that the surface of each cooling hole (12) defined by the

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ceramic layer (20) is not chipped. Support for these amendments can be found in Applicants' specification at paragraphs [0038] and [0039], original claims 5 and 10, and Figures 4-7.

In view of the amendments to their parent claims 1 and 8, dependent claims 5 and 9 have been amended to address the condition of the second through-hole surface defined by the coating/layer (20).

Claim 10 has been canceled in view of its limitations being incorporated into its parent claim 8.

Applicants believe that the above amendments do not present new matter. Favorable reconsideration and allowance of remaining claims 1-9, 11 and 12 are respectfully requested in view of the above amendments and the following remarks.

Objection to the Claims

The Examiner objected to claims 5, 9 and 10 under 37 CFR §1.75(c) "as being of improper dependent form for failing to further limit the subject matter of a previous claim," commenting "does the article of claims 1 and 8 not have components and coatings that are smoothed and deburred by impact flattening?"

As noted above, claim 10 has been canceled in view of its limitation being incorporated into its parent claim 8, and claims 5 and 9 as now amended are directed to the condition of the *second* through-hole surface defined by the coating/layer (12),

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whereas their parent claims recite the "impact flattening" of the *first* through-hole surfaces defined by the component (10).

In view of the above, Applicants respectfully request withdrawal of this objection to the claims under 37 CFR §1.75(c).

Rejection under 35 USC §112, Second Paragraph

Remaining claims 1-9, 11 and 12 were rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as their invention. Applicants respectfully request favorable reconsideration in view of the following comments.

Under the rejection, the Examiner explained that "[i]t is not clear what is removed from the component. . . . Please clarify what is removed from the holes, and if the component and/or the coating are deburred and smoothed."

In response, Applicants have amended independent claims 1 and 8 to clarify that the through-hole/cooling holes (12) each have a first through-hole surface defined by the component (10), and a second through-hole surface defined by a portion of the coating/layer (20) exposed by removal of a deposit (22), as evident from comparing Figures 1 and 2 and reading the related portions of the specification. Therefore, claims 1 and 8 make clear that the deposit (22) is removed from each cooling hole (12), and that its removal defines in part the surface of the cooling hole (12). Furthermore,

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claims 1 and 8 now recite that the first through-hole surface (defined by the component (10)) is impact-flattened, in view of Figures 6 and 7 and the related discussion in paragraphs [0038] and [0039], which include a description of holes (12) as viewed from their entrances (at surface 16 of Figures 1 and 2) opposite the coating (20).

In view of the above remarks and amendments, Applicants respectfully request withdrawal of the rejection under 35 USC §112, second paragraph.

Rejections under 35 USC §102

Independent claims 1 and 8 and their remaining dependent claims 2-7, 9, 11 and 12 were rejected under 35 USC §102 as being anticipated by U.S. Patent No. 6,004,620 to Camm et al. (Camm), EP 1103627A2 to Farmer et al. (Farmer), and U.S. Patent No. 6,368,060 to Fehrenbach et al. (Fehrenbach). Applicants respectfully request reconsideration of these rejections in view of the amendments presented above as well as the following comments.

As noted in §2131 of the MPEP:

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the ...claim. The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e. identity of terminology is not required. (Citations omitted).

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Applicants' independent claims 1 and 8 recite machined through-holes/cooling holes (12) that are required to

- (a) be free of debris from the deposit (22),
- (b) have a first through-hole surface (defined by the component (10)) that is impact-flattened to have a better than as-machined surface finish, and
- (c) have a better than as-machined discharge coefficient (see paragraph [0023]).

Applicants teach at paragraph [0039] that such a cooling hole (12) is obtained with a non-abrasive waterjet treatment in which a non-abrasive media is entrained. Applicants further teach at paragraph [0038] that machined cooling holes with these characteristics are not obtained with a waterjet treatment that does not contain a non-abrasive media. Specifically, a cooling hole treated with a media-free waterjet treatment is disclosed as containing debris from a coating deposited on the component surface, and as having a surface finish that has not been altered from the as-machined condition. Finally, the observed condition of such a hole is said to agree with the tests described earlier in the specification that a media-free waterjet treatment does not increase the discharge coefficient of the hole, but instead decreases its discharge coefficient, from what originally existed following machining of the hole.

Each of the §102 references is cited as treating a cooling hole with a media-free waterjet. Therefore, according to Applicants' reported testing, the waterjet

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treatments performed by these references would not result in holes with the characteristics recited in claims 1 and 8, but instead would result in holes with the characteristics described in paragraph [0038] and shown in Figure 6. While Fehrenbach is cited as allowing for the use of an abrasive-containing waterjet, Applicants teach at paragraph [0008] that the surface condition and appearance of a cooling hole surface treated with an abrasive water jet also differs from one treated in accordance with the invention, because abrasives cut and gouge the surfaces of the hole instead of impact-flattening the hole surfaces.

In view of the above, Applicants believe that Camm, Farmer, and Fehrenbach do not anticipate independent claims 1 or 8 nor any of their dependent claims under the test for anticipation set forth at MPEP §2131, and therefore respectfully request withdrawal of the rejections under 35 USC §102.


Closing

In view of the above, Applicants believe that all the issues outstanding from the Office Action have been addressed, and that the claims define patentable novelty over all the references, alone or in combination, of record. It is therefore respectfully requested that this patent application be given favorable reconsideration.

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Should the Examiner have any questions with respect to any matter now of record, Applicants' representative may be reached at (219) 462-4999.

Respectfully submitted,

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